

Figure 1

```

int TRAILER_calculate_trailer(int ct_x[],
                              int ct_y[],
                              int ct_t[],
                              int ct_length,
                              int *ct_a,
                              int *ct_b)
{
    int i;

    int ct_idx1=TRIALER_INIT_INDEX1,ct_idx2=TRIALER_INIT_INDEX2,
        ct_idx3=TRIALER_INIT_INDEX3,ct_idx4=TRIALER_INIT_INDEX4;

    int ct_idx5=TRIALER_INIT_INDEX5,ct_idx6=TRIALER_INIT_INDEX6,
        ct_idx7=TRIALER_INIT_INDEX7,ct_idx8=TRIALER_INIT_INDEX8;

    int ct_sum1=0,ct_sum2=0,ct_sum3=0,ct_sum4=0;

    int ct_prime[N]=
    { TRAILER_PRIME_11, TRAILER_PRIME_12, ..., TRAILER_PRIME_1N
    };

    int ct_prime1[N1]=
    { TRAILER_PRIME_21, TRAILER_PRIME_22, ..., TRAILER_PRIME_2N1
    };

    if (!ct_x || !ct_y || !ct_t ||
        ct_length<40 || !ct_a || !ct_b) return 0;

    for(i=0;i<ct_length;++i)
    {
        // Second and third order sums.
        ct_sum1+=ct_prime[ct_idx1]*ct_prime1[ct_idx5];
        ct_sum2+=ct_prime[ct_idx2]*ct_prime1[ct_idx6];
        ct_sum3+=ct_prime[ct_idx3]*ct_prime1[ct_idx7];
        ct_sum4+=
            ct_prime[ct_idx6]* ct_prime[ct_idx4]*ct_prime1[ct_idx8]*
            ct_x[i]*ct_y[i]*ct_t[i];
    }

    return 1;
}

```

Figure 2

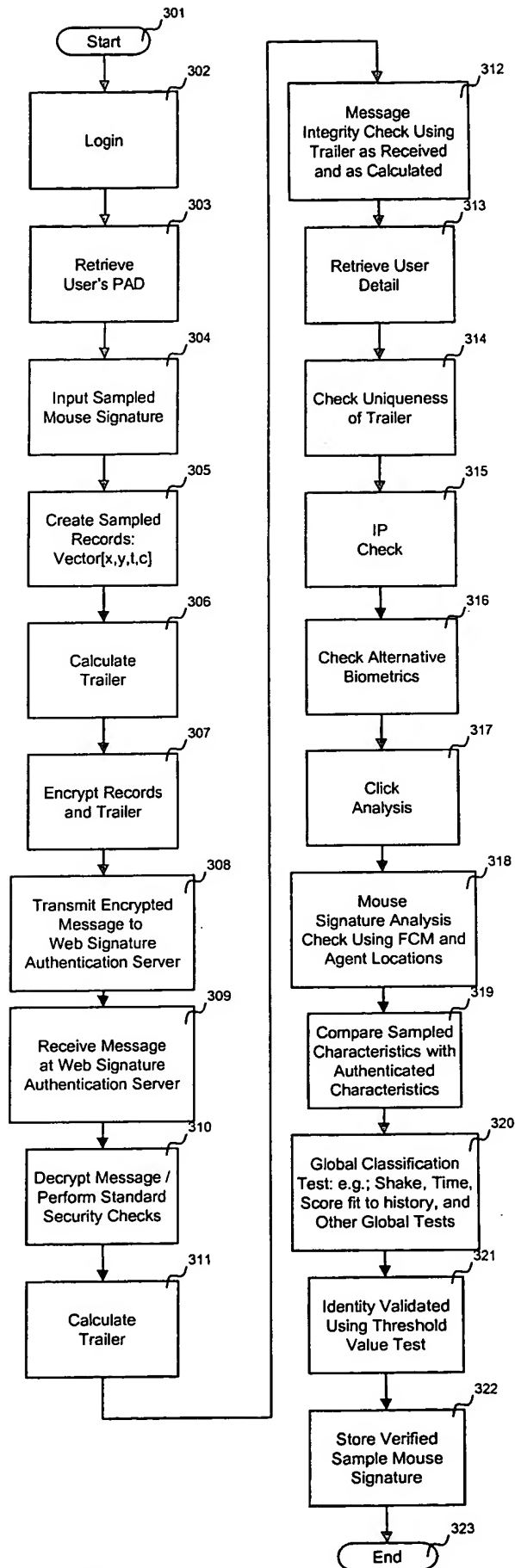


Figure 3

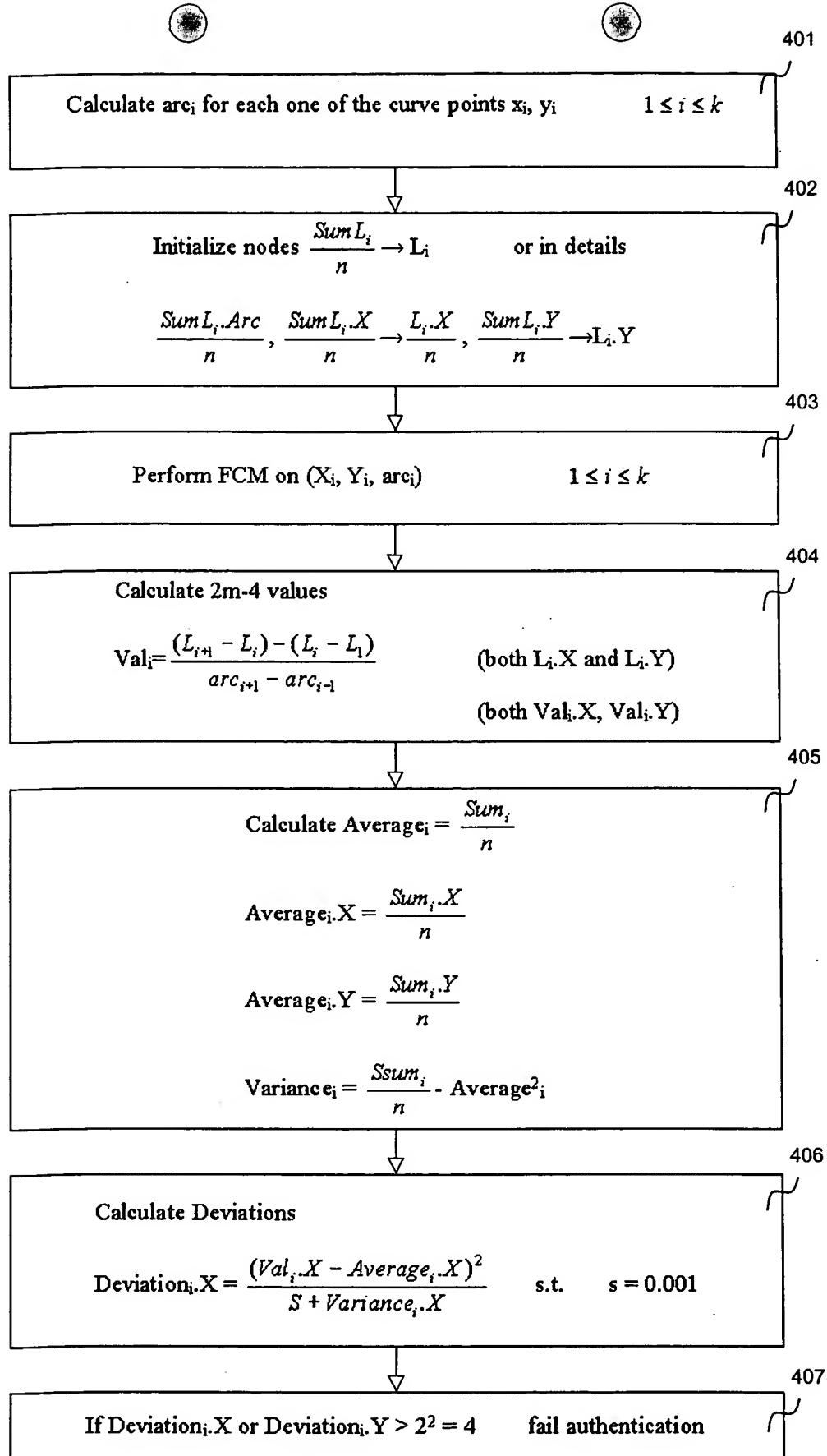


Figure 4

Calculate the number of times that the curvature changes sign

If X_i, Y_i is the curve

The sign is taken from

$$\Delta X_i = X_i - X_{i-1}, \quad \Delta Y_i = Y_i - Y_{i-1}$$

$$\Delta X_{i+1} = X_{i+1} - X_i, \quad \Delta Y_{i+1} = Y_{i+1} - Y_i$$

$$Val = \#(\text{sgn}(\Delta X_i \Delta Y_{i+1} - \Delta Y_i \Delta X_{i+1}))$$

sgn is either 1 or -1 or 0. The value is calculated as the number of times that sgn changes from 1 to -1 or from -1 to 1.

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$$\text{Calculate Average} = \frac{\text{Sum}}{n} \quad \text{Sum} = \sum_{k=1}^n Val_k$$

$$\text{Calculate Variance} = \text{Ssum} \quad \text{Ssum} = \sum_{k=1}^n Val_k^2$$

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Calculate deviation

$$\text{Dev} = \frac{(Val - \text{Average})^2}{s + \text{Variance}} \quad s = 0.0001$$

If $\text{Dev} > 9$ then fail

Figure 5

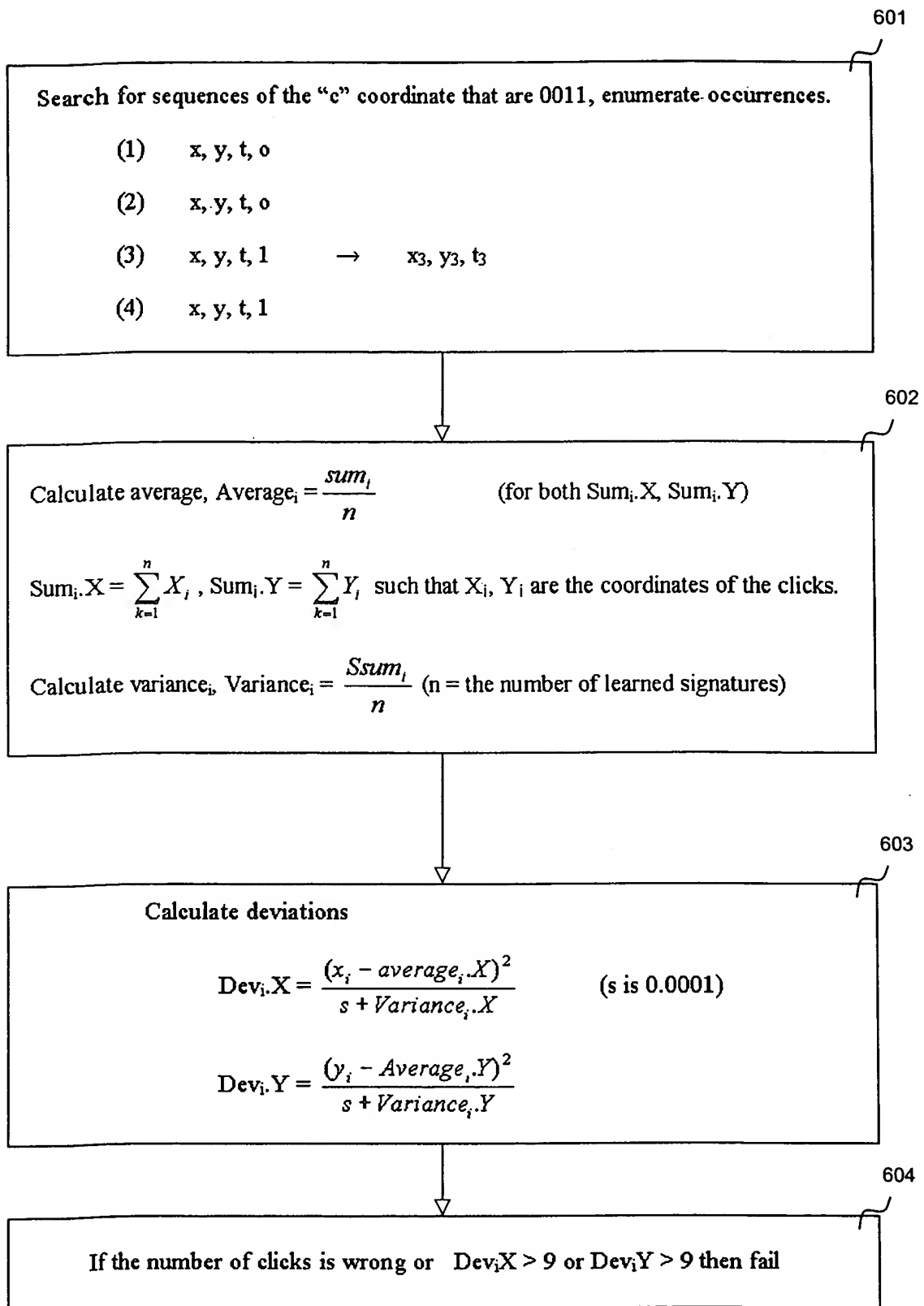


Figure 6

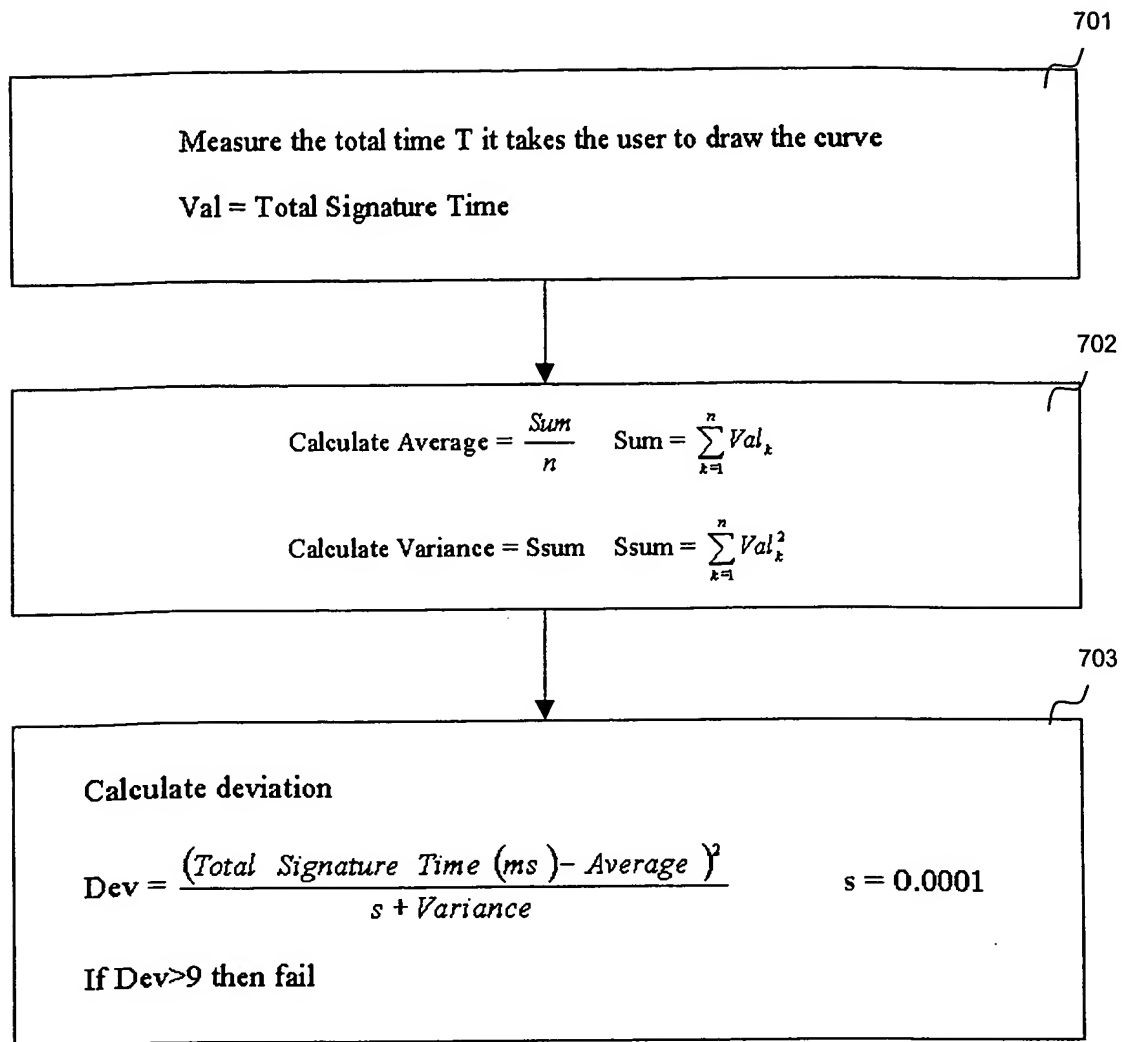


Figure 7

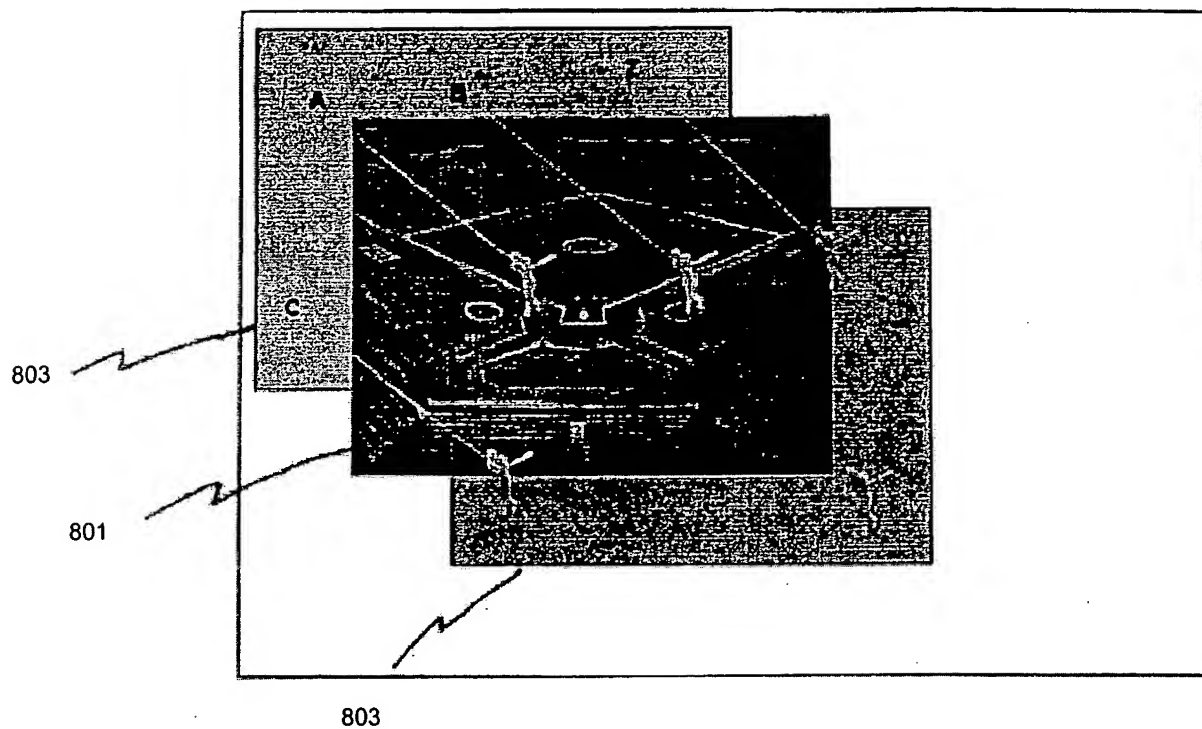


Figure 8

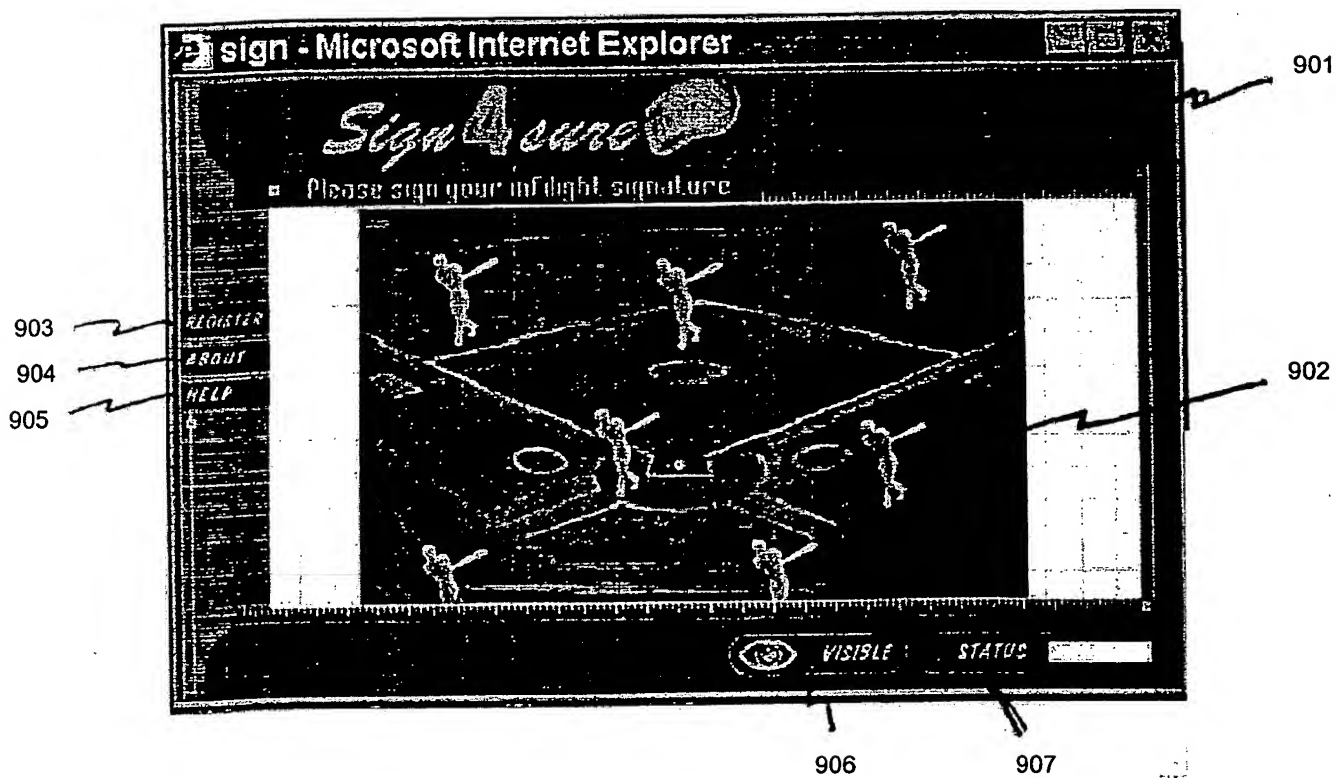


Figure 9

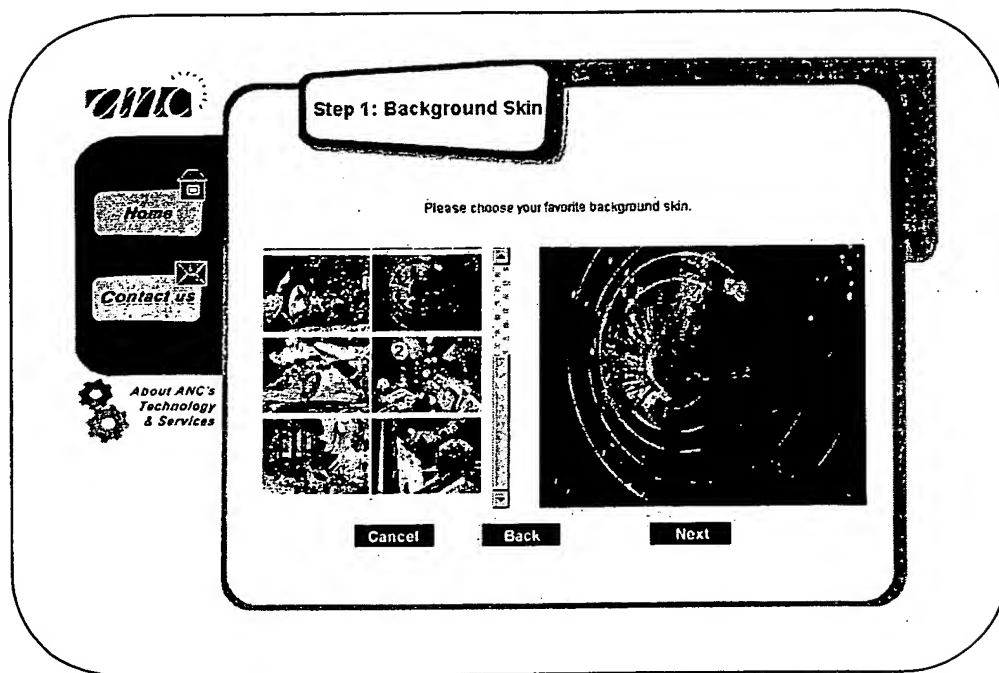


Figure 10

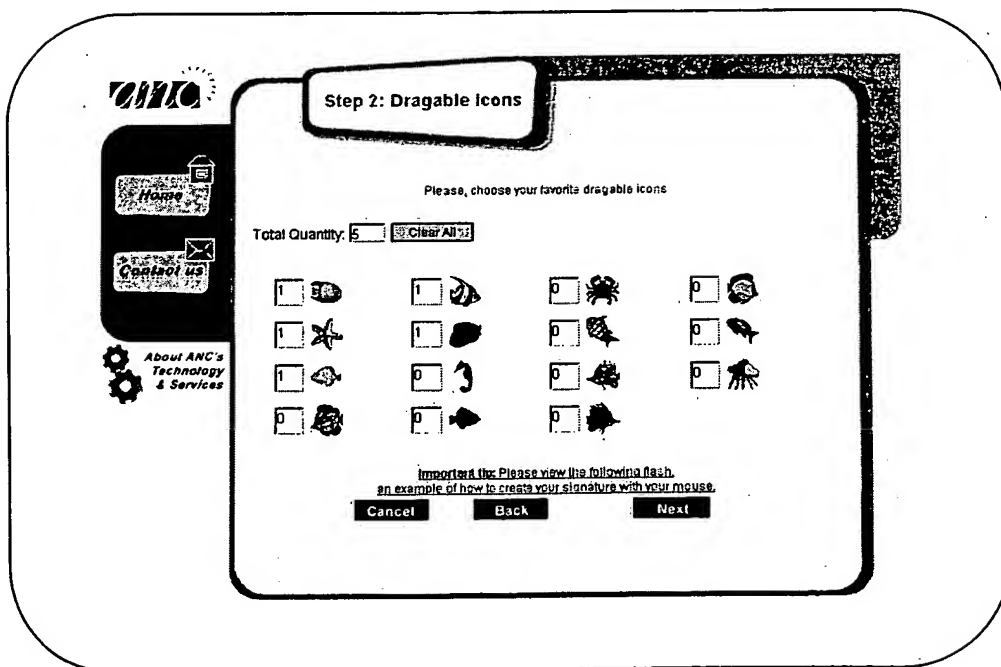


Figure 11

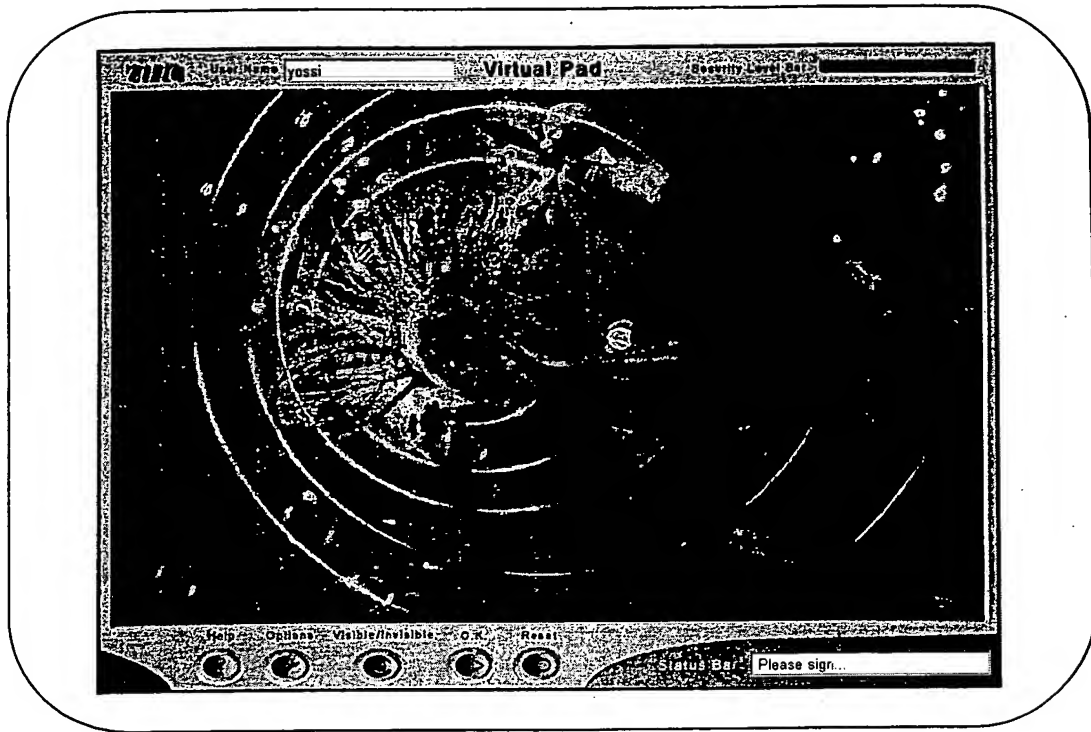


Figure 12

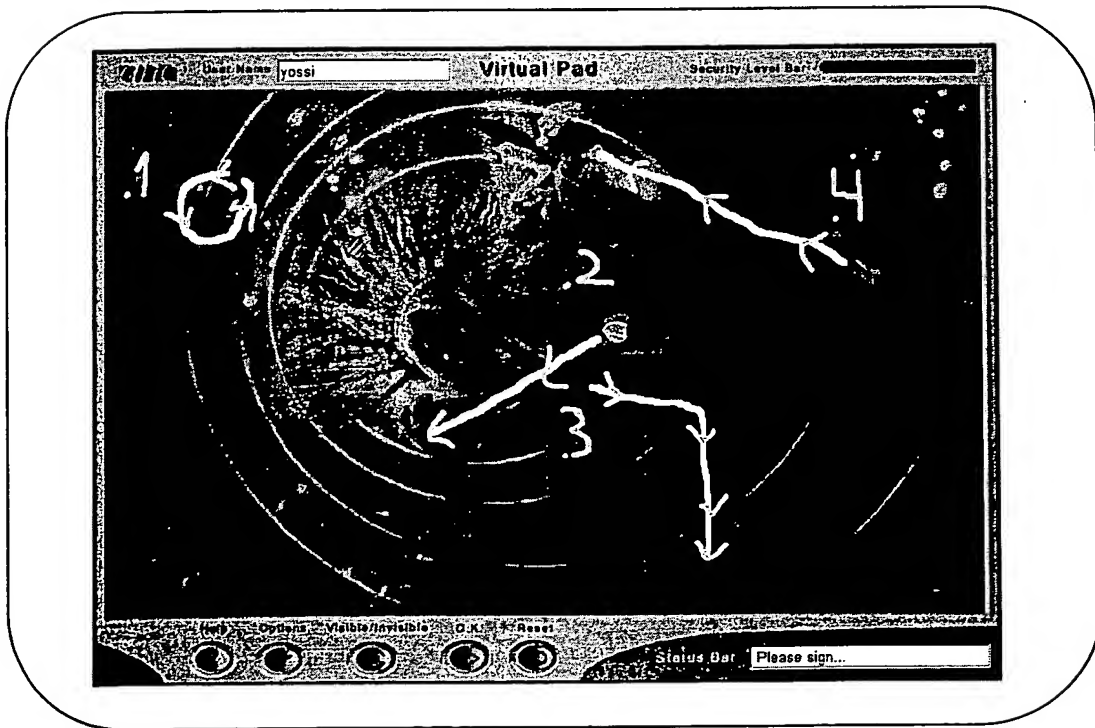


Figure 13

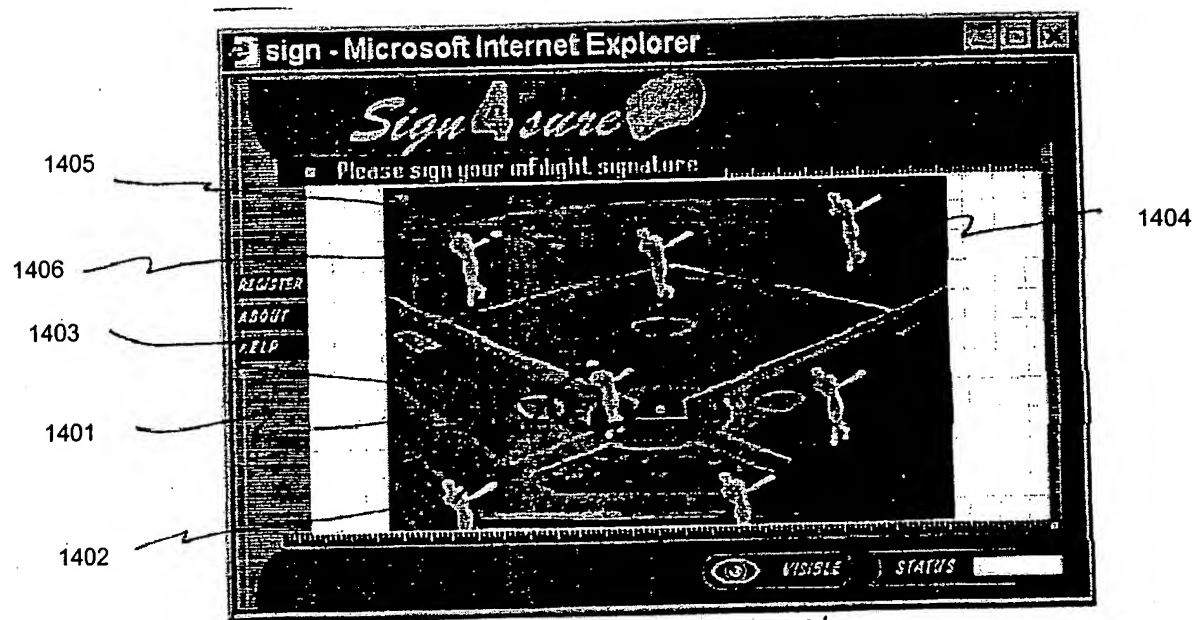


Figure14

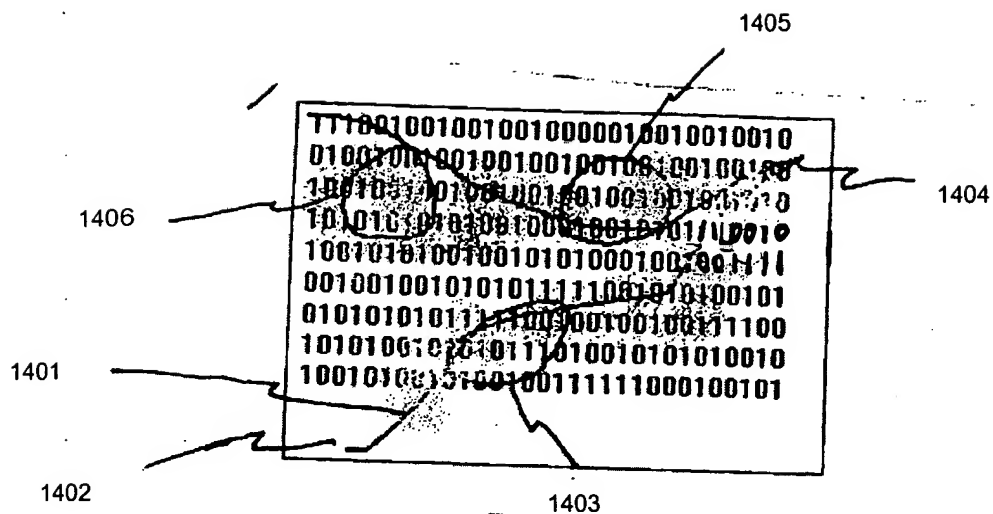


Figure 15

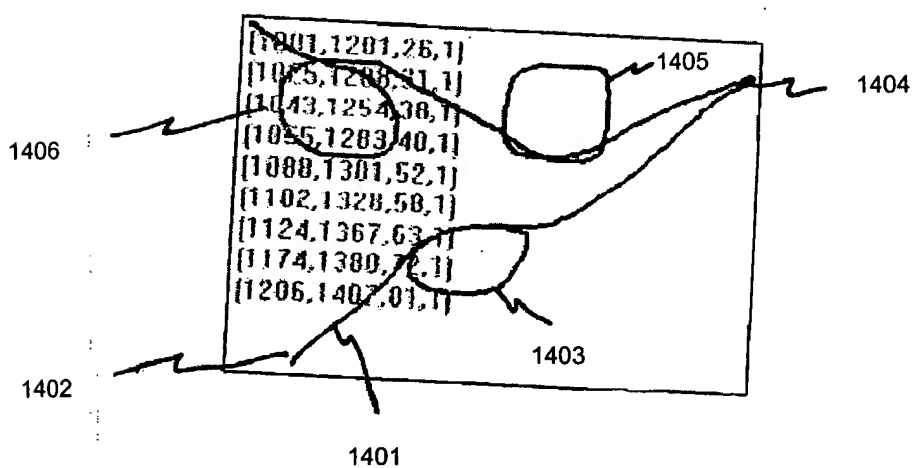


Figure 21

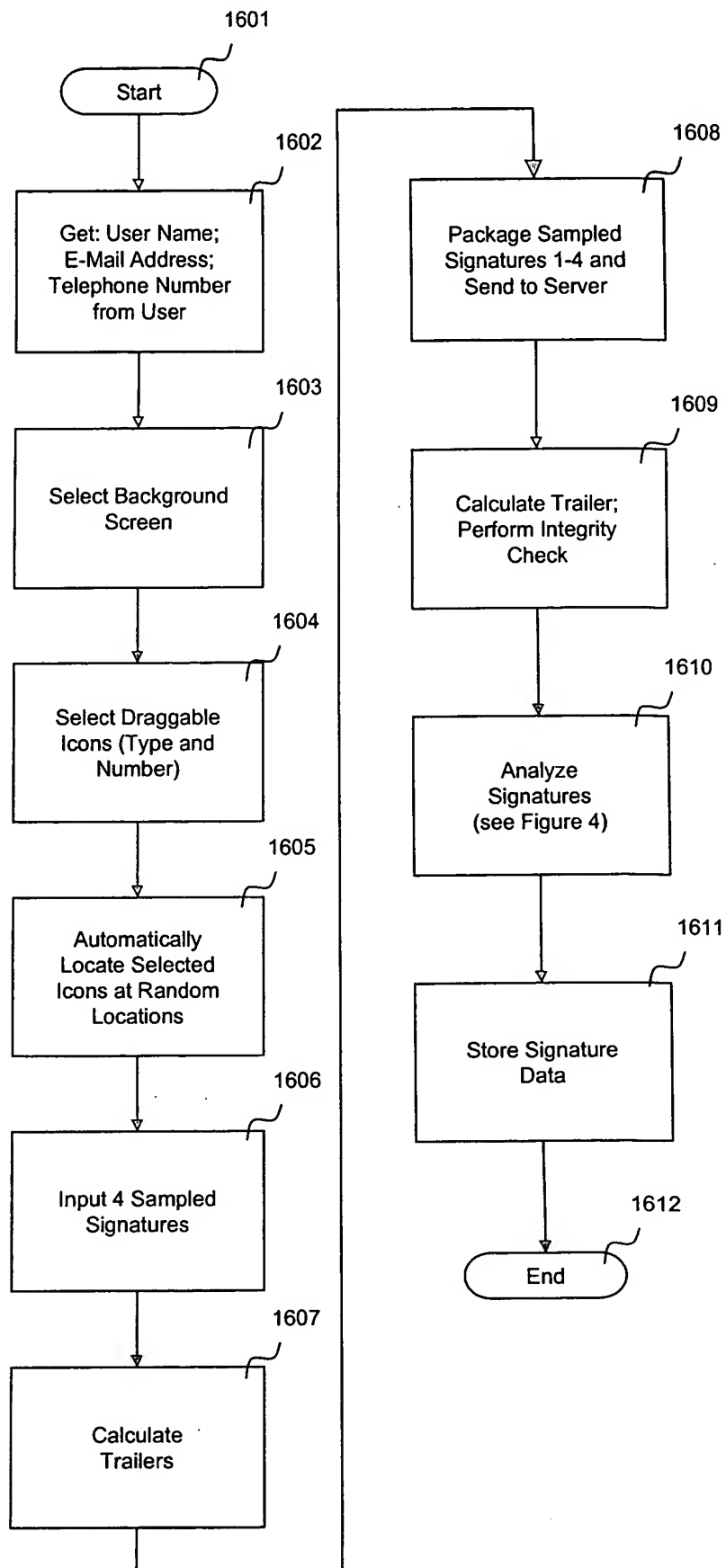


Figure 16

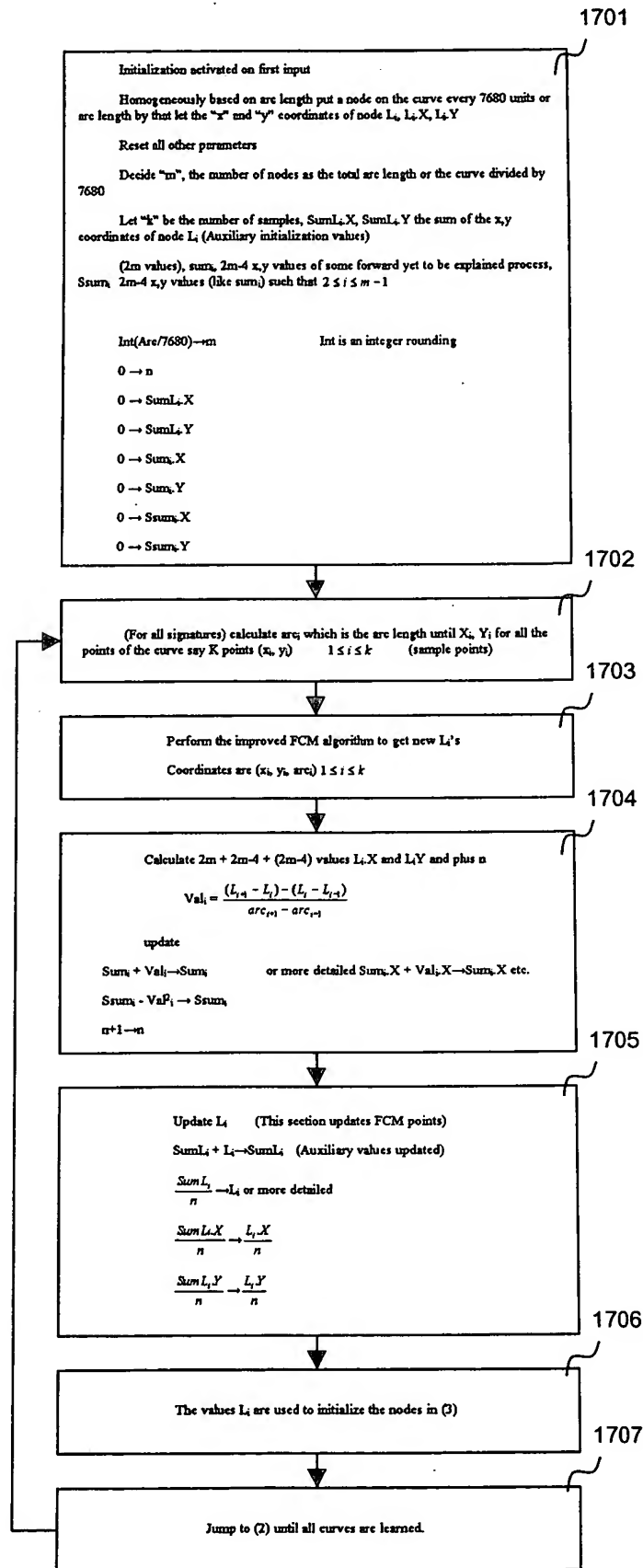


Figure 17

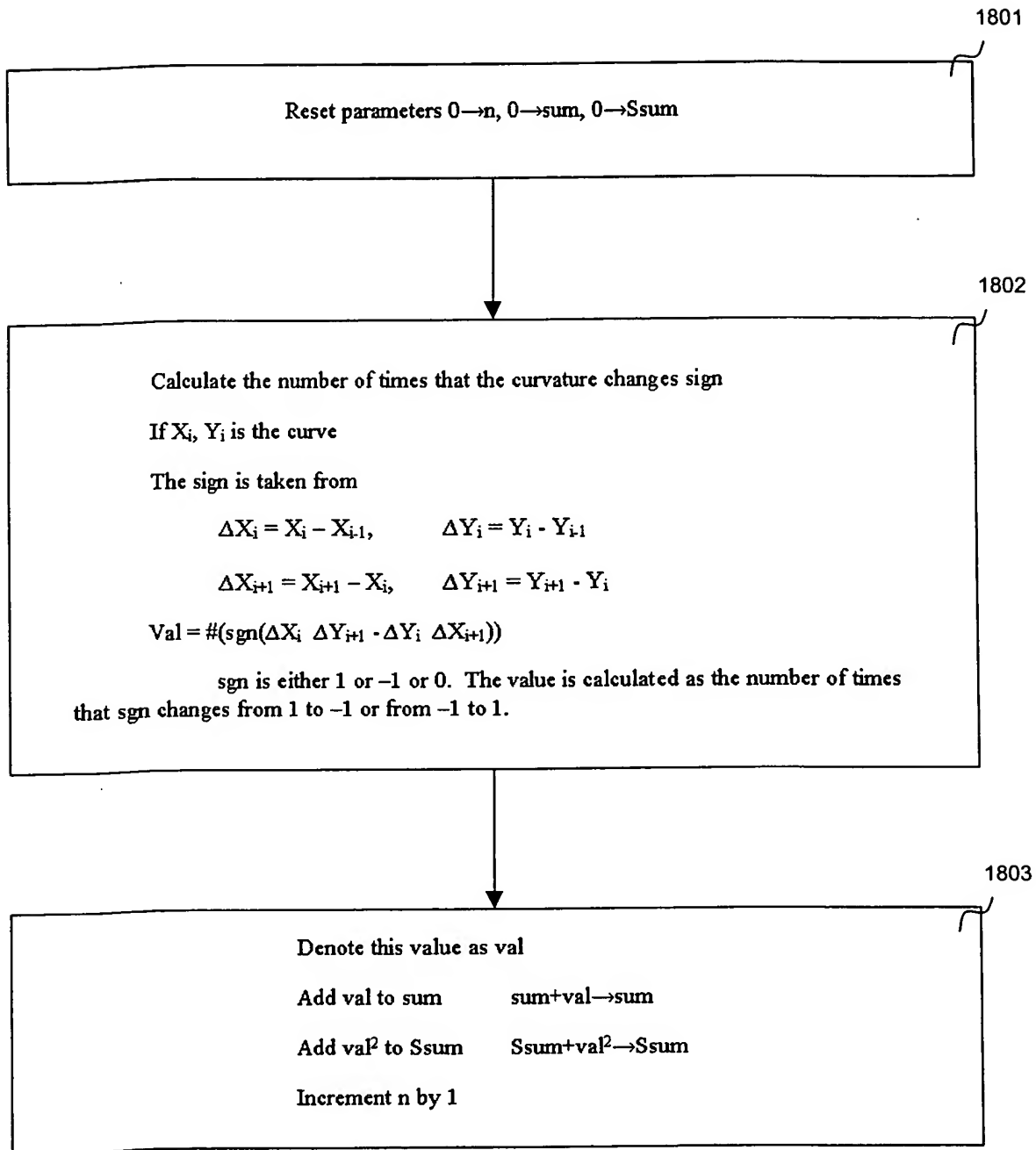


Figure 18

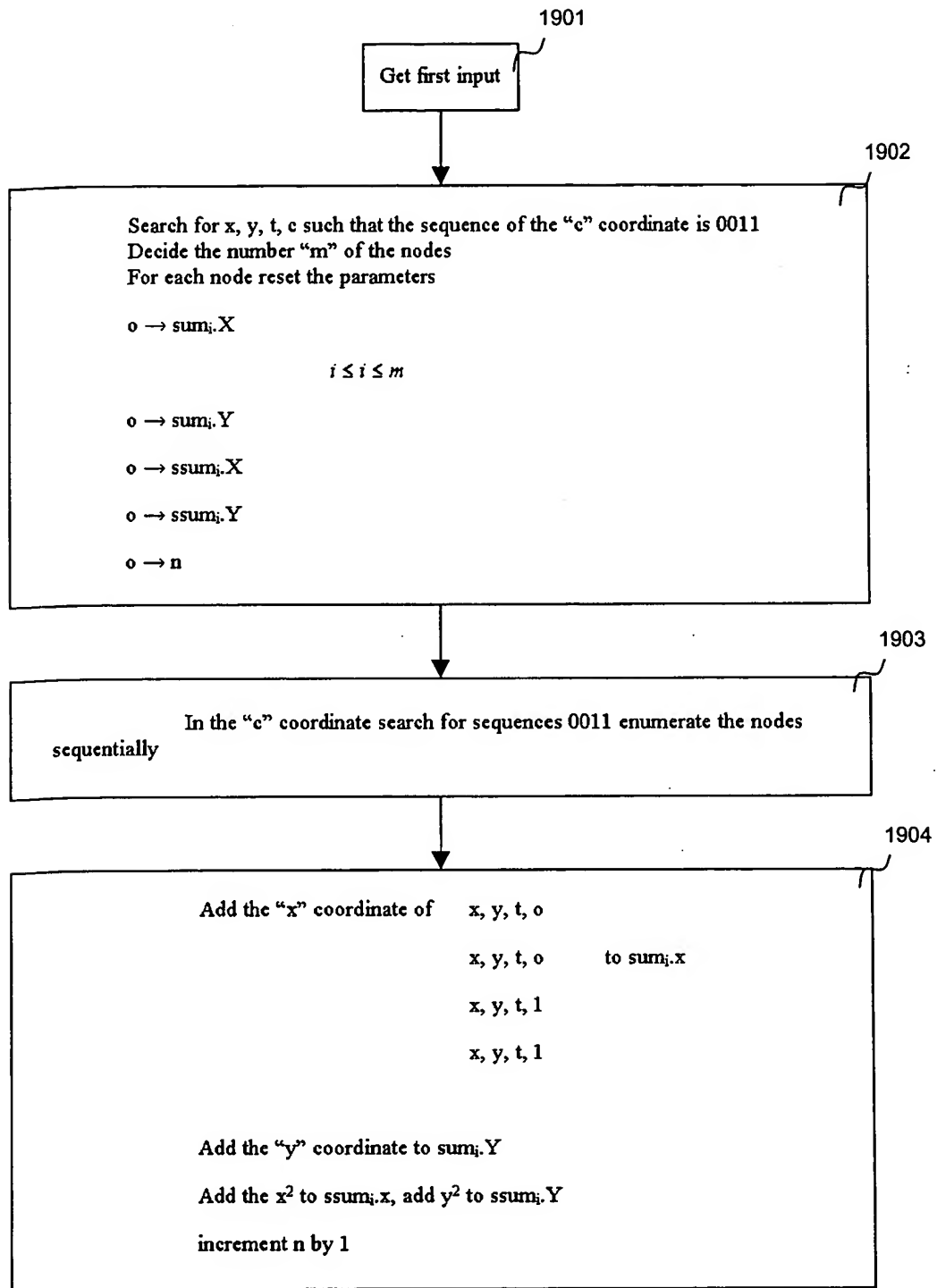


Figure 19

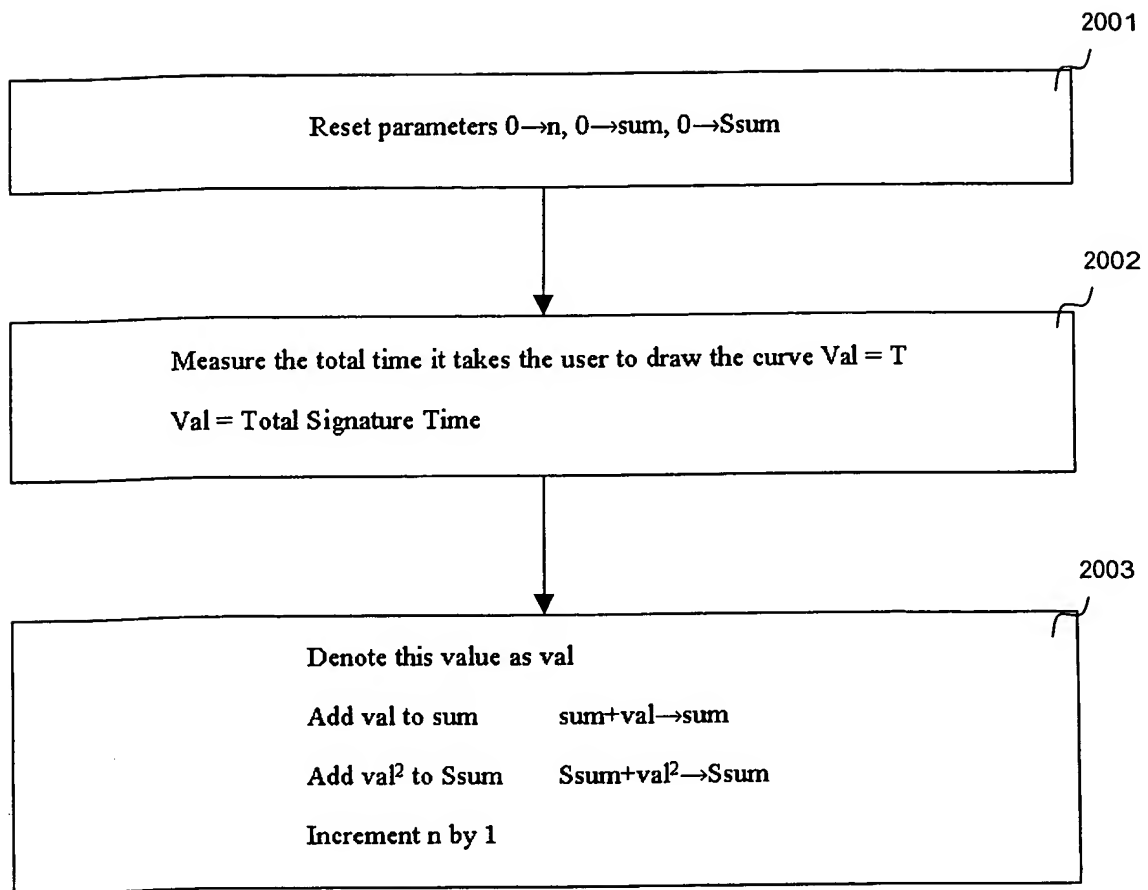


Figure 20

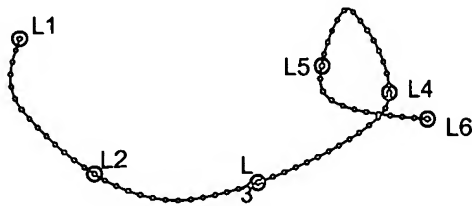
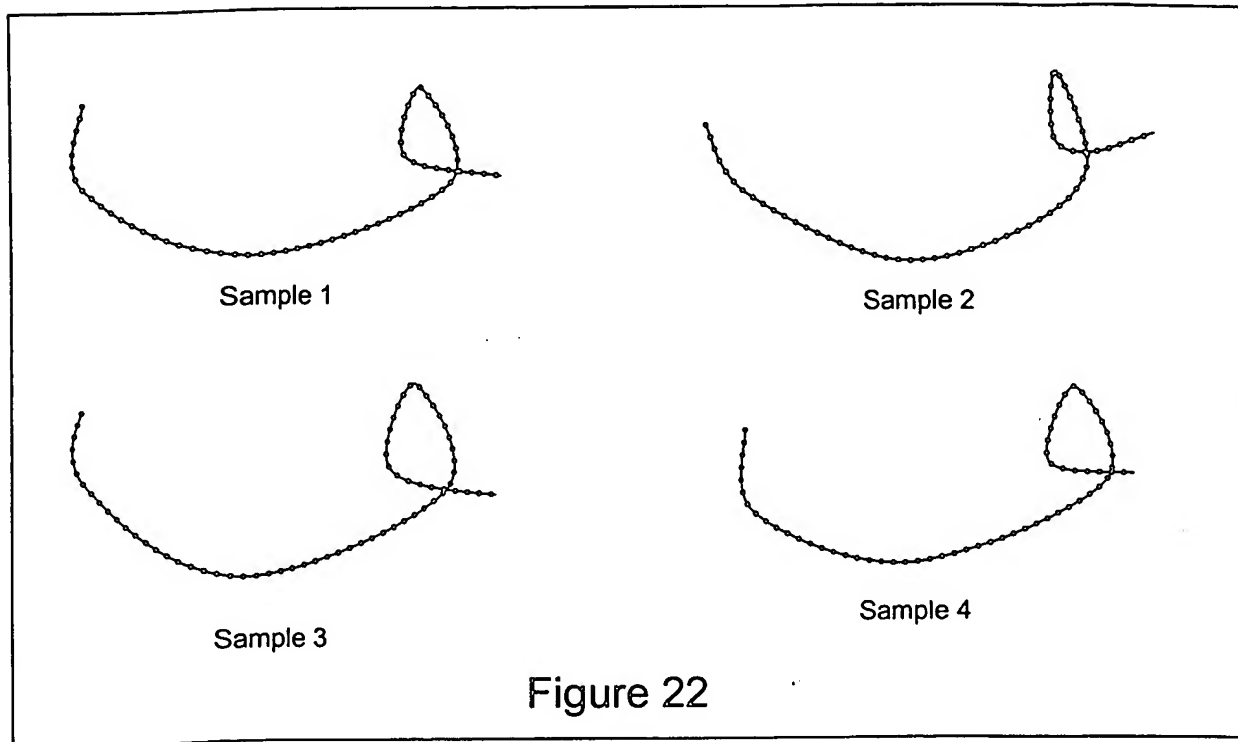


Figure 23

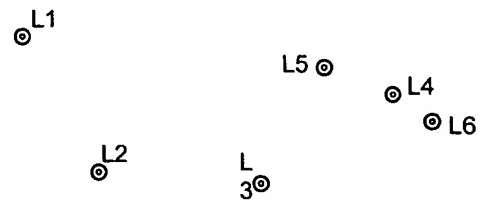
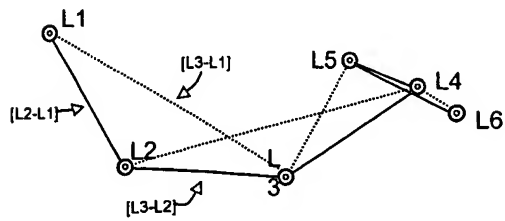


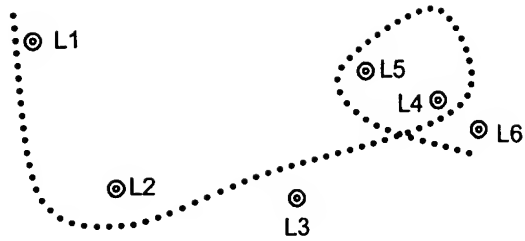
Figure 24



$$Val_i = \frac{[L_{i+1} - L_i] - [L_i - L_{i-1}]}{\text{ArcLength } [L_{i+1} \rightarrow L_{i-1}]}$$

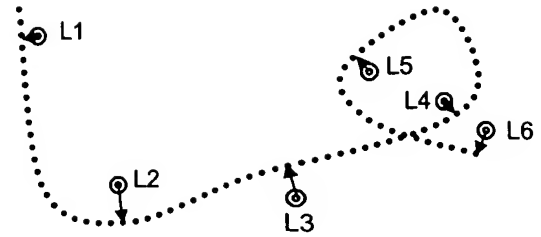
Store n-2 Geometric Characteristic Vectors in User
Profile Database as a User Authenticated Signature Profile

Figure 25



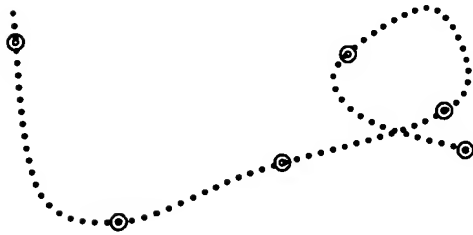
Sampled Signature with
Nodes or Agents As Stored

Figure 26



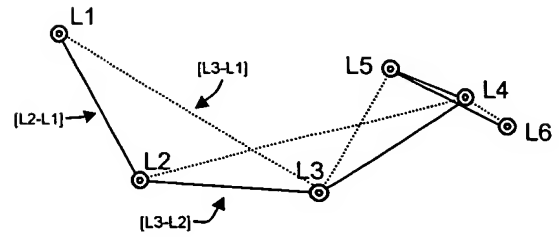
FCM to Migrate Nodes Toward Curve

Figure 27



Nodes Located on Curve by FCM

Figure 28



Form Geometric Characteristic Vector:

$$Val_i = \frac{[L_{i+1} - L_i] - [L_i - L_{i-1}]}{\text{ArcLength } [L_{i+1} \rightarrow L_{i-1}]}$$

Store n-2 Geometric Characteristic Vectors in User
Profile Database as a User Authenticated Signature Profile

Figure 29

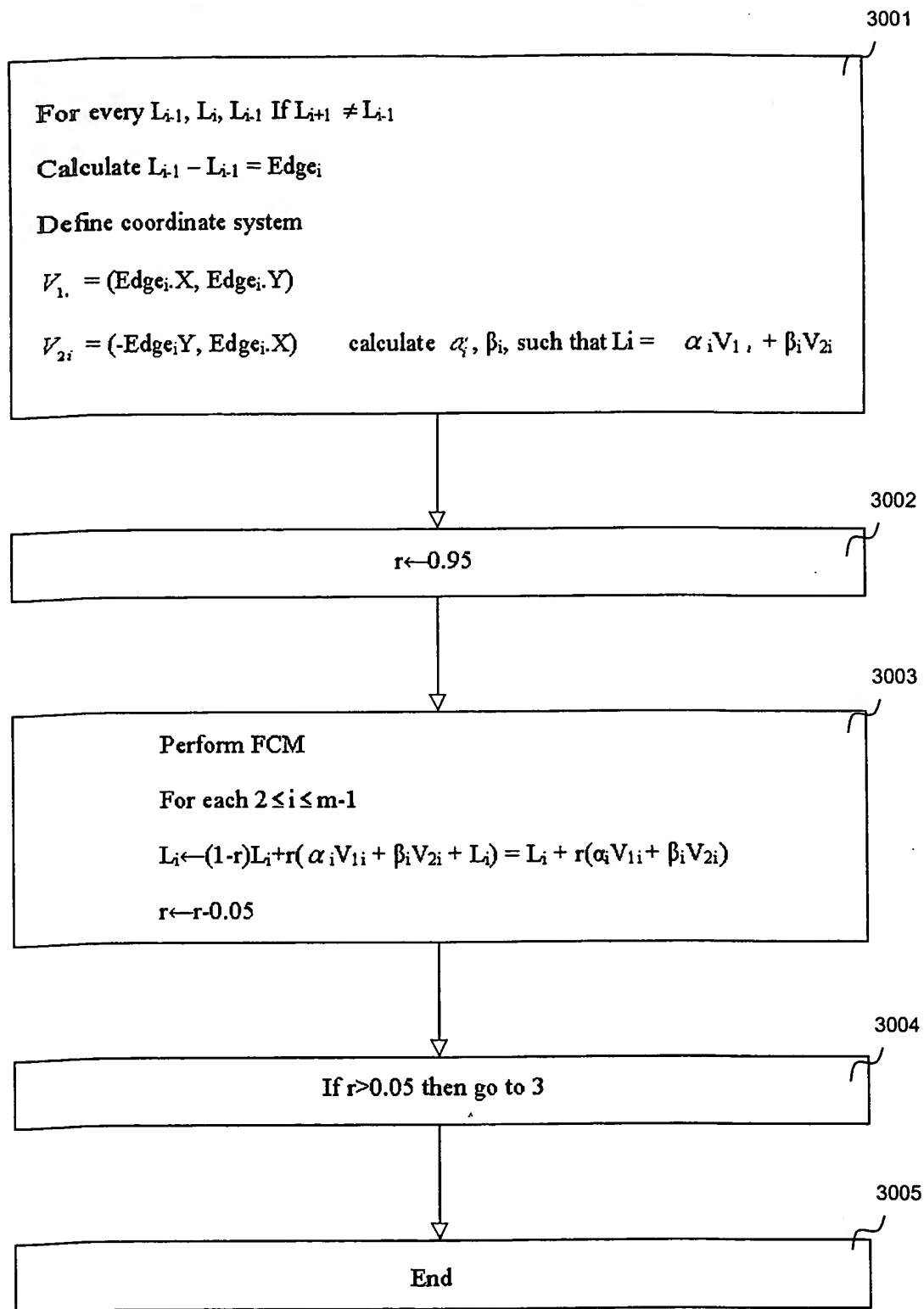


Figure 30